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|-----------------|-------------|----------------------|---------------------|------------------|
| 09/458,875      | 12/10/1999  | DAVID J. KELLER      | 99-0738             | 9389             |

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KEVIN D MARTIN  
MAIL STOP 525  
MICRON TECHNOLOGY INC  
8000 S FEDERAL WAY  
BOISE, ID 83706-9632

EXAMINER

GOUDREAU, GEORGE A

| ART UNIT | PAPER NUMBER |
|----------|--------------|
|----------|--------------|

1763

DATE MAILED: 05/06/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

|                                     |                               |
|-------------------------------------|-------------------------------|
| Application No.<br><b>09-456875</b> | Applicant(s)<br><b>Keller</b> |
| Examiner<br><b>George Goudreau</b>  | Group Art Unit<br><b>763</b>  |

— The MAILING DATE of this communication appears on the cover sheet beneath the correspondence address —

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, such period shall, by default, expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- ☒ Responsive to communication(s) filed on 2-03-02 (Re, - paper # 12)
- ☐ This action is **FINAL**.
- ☐ Since this application is in condition for allowance except for formal matters, **prosecution as to the merits is closed** in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11; 453 O.G. 213.

## Disposition of Claims

- ☒ Claim(s) 27-30, 33-38 is/are pending in the application.
- Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- ☒ Claim(s) 33, 37-38 is/are allowed.
- ☒ Claim(s) 27-30, 34-36 is/are rejected.
- ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- ☐ Claim(s) \_\_\_\_\_ are subject to restriction or election requirement

## Application Papers

- ☐ The proposed drawing correction, filed on \_\_\_\_\_ is ☐ approved ☐ disapproved.
- ☐ The drawing(s) filed on \_\_\_\_\_ is/are objected to by the Examiner
- ☐ The specification is objected to by the Examiner.
- ☐ The oath or declaration is objected to by the Examiner.

## Priority under 35 U.S.C. § 119 (a)-(d)

- ☐ Acknowledgement is made of a claim for foreign priority under 35 U.S.C. § 119 (a)-(d).
- ☐ All ☐ Some\* ☐ None of the:
- ☐ Certified copies of the priority documents have been received.
- ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_
- ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a))

\*Certified copies not received: \_\_\_\_\_

## Attachment(s)

- ☐ Information Disclosure Statement(s), PTO-1449, Paper No(s). \_\_\_\_\_
- ☐ Notice of Reference(s) Cited, PTO-892
- ☐ Notice of Draftsperson's Patent Drawing Review, PTO-948
- ☐ Interview Summary, PTO-413
- ☐ Notice of Informal Patent Application, PTO-152
- ☐ Other \_\_\_\_\_

Office Action Summary

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15. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless --

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

16. Claims 27-28, and 34-35 are rejected under 35 U.S.C. 102(b) as being anticipated by Zhou et al. (5,792,708).

Zhou et al. disclose a two step etching process for patterning a polysi layer (44) on top of a SiO<sub>2</sub> layer (42) which has been conformably deposited onto the surface of pair of gates (36) on a wafer (30). A patterned photo resist etch mask (46) is employed during the etching process. The first step is used to anisotropically rie etch the polysi layer (44) in a plasma which is comprised of (Cl<sub>2</sub>-HBr) which leaves behind polysi stringers. The second, isotropic, etching step is used to remove the polysi stringers in a plasma which is comprised of (SF<sub>6</sub>-HBr). This is discussed specifically in columns 10-11; and discussed in general in columns 1-16. This is shown in figures 1-9.

17. Claims 27-28, and 34-35 are rejected under 35 U.S.C. 102(b) as being anticipated by Webb et al. (5,228,950).

Webb et al. disclose a process for patterning a polysi line (30) on top of a SiO<sub>2</sub> layer (26) which has been conformably deposited over a series of gates (22) on a wafer using a patterned photo resist etch mask, and a two step rie etching process. In the first etching step, the polysi is anisotropically rie etched to leave behind polysi stringers. In the second etching step, the polysi

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stringers are isotropically rie etched using a plasma comprised of (NF3-O2). This is discussed specifically in columns 4-5; and discussed in general in columns 1-8. This is shown in figures 1-5.

18. Claims 27-28, and 34-35 are rejected under 35 U.S.C. 102(b) as being anticipated by Schwartzman et. al. (4,818,334).

Schwartzman et. al. disclose a process for patterning polysi runners (22) on top of Si islands (16) which are covered with a SiO2 layer (18) using a patterned photo resist etch mask (24), and a two step etching process. In the first etching step, the polysi is anisotropically rie etched in a plasma comprised of (N2-Cl2-CHCl3) to leave behind polysi stringers. In the second etching step, the polysi stringers are isotropically rie etched using a plasma which is comprised of (CO2-Cl2-He). This is discussed specifically in columns 1-4; and 1-6. This is shown in figures 1-5.

19. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

20. Claims 29-30, and 36 are rejected under 35 U.S.C. 103(a) as being unpatentable over any of the references as applied in paragraphs 16-18 above further in view of Rizzuto (6,001,688)

The references as applied in paragraphs 16-18 above fail to disclose the following aspects of applicant's claimed invention:

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- the specific etching process parameters which are claimed by the applicant;
- the specific plasma etch chemistries which are claimed by the applicant; and
- the specific usage of the type of rie etcher which is claimed by the applicant

Rizzuto teaches that it is desirable to conduct a two step rie etching process when patterning polysi. In the first etch step, the polysi is anisotropically rie etched in a plasma comprised of (HBr-O<sub>2</sub>) leaving behind polysi stringers. In the second etch step, the polysi stringers are removed by isotropically rie etching them in a plasma which is comprised of (SF<sub>6</sub> or CF<sub>4</sub>) plus O<sub>2</sub>. This is discussed specifically in columns 5-6; and discussed in general in columns 1-10.

It would have been obvious to one skilled in the art to use the two step plasma etching process taught by Rizzuto to pattern the polysi layer in any of etching processes taught in paragraphs 16-18 above based upon the following. First, Rizzuto teaches that it is desirable to use their plasma etching process to pattern a polysi layer. Second, this simply represents the usage of an alternative, and at least equivalent means for conducting any of the etching processes taught above to the specific means which are taught above.

It would have been obvious to one skilled in the art to employ the specific type of rie etching apparatus which is claimed by the applicant to conduct any of the etching processes taught in paragraphs 16-18 above based upon the following. The specific usage of the type of rie etching apparatus which is claimed by the applicant is conventional or at least well known in the plasma etching arts. (The examiner takes official notice in this regard.) Further, this simply

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represents the usage of an alternative, and at least equivalent means for conducting etching process taught above to the specific means which are taught above.

It would have been prima facie obvious to employ any of a variety of different etching process parameters in the etching process taught above including those which are specifically claimed by the applicant. These are all well known variables in the plasma etching art which are known to effect both the rate and quality of the plasma etching process. Further, the selection of particular values for these variables would not necessitate any undo experimentation which would be indicative of a showing of unexpected results.

Alternatively, it would have been obvious to one skilled in the art to employ the specific etching process parameters which are claimed by the applicant based upon In re Aller as cited below.

"Where the general conditions of a claim are disclosed in the prior art, it is not inventive to discover the optimum or workable ranges by routine experimentation." In re Aller, 220 F. 2d 454, 105 USPQ 233, 235 (CCPA).

Further, all of the specific process parameters which are claimed by the applicant are results effective variables whose values are known to effect both the rate, and the quality of the plasma etching process.

21. Claims 33, and 37-38 are allowed.

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22. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Examiner George A. Goudreau whose telephone number is (703) -308-1915. The examiner can normally be reached on Monday through Friday from 9:30 to 6:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Examiner Gregory Mills, can be reached on (703) -308-1633. The appropriate fax phone number for the organization where this application or proceeding is assigned is (703) -306-3186.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) -308-0661.

  
George A. Goudreau/gag

Primary Examiner

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